DOCUMENT RESUME

ED 135 696 SO 009 803

AUTHOR Sala, Teresa
TITLE The Introduction of New Elements of Knowledge into Upper Secondary Education in Italy, 1971-1975. Education and Culture.
INSTITUTION Council of Europe, Strasbourg (France). Committee for General and Technical Education.
REPORT NO CCC-EGT-76-16-E
PUB DATE 76
NOTE 45p.; Not available in hard copy due to poor legibility of original document

EDRS PRICE MF-$0.83 Plus Postage. HC Not Available from EDRS.
DESCRIPTORS *Case Studies; *Communications; *Comparative Education; Course Descriptions; Cultural Context; *Cultural Environment; *Educational Change; Educational Innovation; Educational Objectives; Educational Policy; Educational Trends; Experimental Curriculum; Foreign Countries; Interdisciplinary Approach; School Community Relationship; Secondary Education; Socialization; Socioeconomic Influences; Technological Advancement
IDENTIFIERS *Italy

ABSTRACT

Educational trends in Italy are investigated and case studies are presented of experimental courses in communications at five secondary schools. The study is arranged in five chapters. The first chapter examines the relationships among the creative process, the cultural context, and socio-economic influences. The second chapter presents the framework within which the main lines of innovation have developed. Topics discussed are basic assumptions of educational innovation, particulars of secondary schools in Italy, difficulties encountered with new knowledge and new practices, and factors which cause the new information to be adopted. Five case studies are presented in the third chapter. Each case study includes description of the course, objectives, content and organization of the experiment, and an assessment. The schools hosting the experimental courses are located in Rome, Milan, Lombardy, and Reggio Emilia. The courses deal with the languages and codes of communication technology, mass communication, the environment, school community relationship, and data processing. Chapter four discusses the relationship between machines and men in the Italian educational system, followed by presentation of summary and conclusions in chapter five. Factors identified as contributing to educational innovation are willingness to change objectives and experiment. Factors hindering change are traditional methods, social confusion, and divergent expectations. (Author/DB)

Documents acquired by ERIC include many informal unpublished materials not available from other sources. ERIC makes every effort to obtain the best copy available. Nevertheless, items of marginal reproducibility are often encountered and this affects the quality of the microfiche and hardcopy reproductions ERIC makes available via the ERIC Document Reproduction Service (EDRS). EDRS is not responsible for the quality of the original document. Reproductions supplied by EDRS are the best that can be made from the original.

ED135696

DEC 2 8 1976

COUNCIL OF EUROPE

CONSEIL DE L'EUROPE

EDUCATION & CULTURE

Doc. CCC/EGT (76) 16 - E

U S DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

THE INTRODUCTION OF NEW ELEMENTS OF KNOWLEDGE INTO UPPER SECONDARY EDUCATION IN ITALY 1971 - 1975

SCOPE OF INTEREST NOTICE

The ERIC Facility has assigned this document for processing to: EA SO

In our judgement, this document is also of interest to the clearinghouses noted to the right. Indexing should reflect their special points of view. SP

SO 009 803

2

COUNCIL FOR CULTURAL CO-OPERATION
Committee for General and Technical Education
Strasbourg
1976

Strasbourg 1 July 1976 CCC/EGT (76) 16

COMMITTEE FOR GENERAL AND TECHNICAL EDUCATION

THE INTRODUCTION OF NEW ELEMENTS OF KNOWLEDGE INTO UPPER SECONDARY EDUCATION IN ITALY, 1971-1975

by

Professor Teresa Sala of the Office of
Studies and Programming,
Ministry of Education

3

45.431
04.2

CONTENTS

		Page
1.	Socio-economic and cultural context and creative process.	1
2.	Framework within which the main lines of innovation have developed.	3
3.	Case studies:	
	- communication technology: languages and codes;	8
	- mass communication: audio-visual message;	13
	- communication in the environment: the messages of phenomena;	17
	- communication within the school community and between it and the outside world;	23
	- computers and data processing.	28
4.	Machines and men in educational communication.	33
5.	Summary and conclusions.	36

Foreword

Socio-economic and cultural context and creative process

The situation in Italy could be described as follows. In the last few years it has been found advisable to embody new developments in the school system in a series of legislative and administrative acts designed to support an on-going programming process, rather than in a formally structured plan, as in the past; it has also been found advisable to implement the new developments by means of successive interventions, making adjustments as they become necessary, rather than a single reform act.

The reason for this approach is that whenever an attempt has been made (and has been successful) to grasp the essence of the "new", in the many and changing facets of society, the result, when it came to be incorporated into the school system, was already obsolete or corresponded to a type of society that no longer existed. This permanent time-lag between society and the school has several causes: the excessively rapid development of science, technology and industrialisation, and all the intensive phenomena accompanying them (primacy of the masses, of mechanisation, techniques, symbols and dehumanisation) have transformed societies so radically that their traditional ideas and values are no longer the same.

In Italy, the crisis in socio-economic and cultural forces has not led down the path traced by Ilich and Reimer, towards a dream of a destructured school and a deschooled society (as though the educational apparatus or the megalopolis was alone responsible for the entire crisis); on the contrary, it has produced a clear determination to revise, consolidate and enrich the existing structures - resulting in a "hyperschooled" rather than a "deschooled" society - and a stubborn search for new certainties to put in the place of the contested values: new models of behaviour, new forms of relationships between people, and between people and external realities which, as realities are and must remain unchanged.

Notwithstanding the Gospel, Richmond would say this is putting new wine into old bottles; we would say ancient rather than old, and for that reason still valid today and perhaps forever.

Since 1971 this tension, or continuous and never-ending creative process, has been expressed in various ways:

1. There have been a large number of legislative and administrative measures, of which only the most important are mentioned below:

- a ministry circular in 1971, establishing the autonomy of schools and teachers and the participation of all parts of society in the life of the school;

- a series of government proposals, also made public in 1971, which have formed the basis for school policies in all areas since that time;

- an initial school district proposal, debated in 1972 by a meeting of regional assessors;

- an outline act dated 30 July 1973 (No. 477), in which the government undertook to lay down standards for the achievement of project-objectives;

- a series of implementing decrees, dated 31 May 1974 (Nos. 416,417,419 and 420) to which frequent reference will be made below.

2. Many attempts have been made, and are continuing to be made, to create new secondary education structures in keeping with socio-economic and cultural demands: seven reform bills have been tabled in parliament thus far, and there is a possibility of an eighth government proposal.

3. Various original contributions to the reform of secondary education have appeared, in the form of instants in a continuous process of experimentation based on a dynamic and open concept of the school: at this time 112 experimental schools have been set up throughout the country.

Project-objectives, proposals for reforms, and experimentation: these are the paths - long, uncertain and ill-marked - which Italy intends to follow in its efforts to achieve a desired renewal of education and society.

o

Framework within which the main lines of innovation have developed

I. Basic assumptions

When introducing new elements of knowledge or practices into the school, the first problem to arise is this: if a reform is to take root and grow, the conditions in which it can become effective must already exist.

The Act previously mentioned, No. 477 of 1973, and the subsequent implementing decrees adopted in 1974, are rightly regarded as the truest innovations in the Italian school system, on the ground that their provisions are pre-requisites for all further reforms of structures, methods and contents:

a. communal management of the school by all social, economic and cultural entities concerned in the educational process: pupils and parents, school administration and labour forces, firms and trade unions, economy and market experts, lawyers and government officials (DPR No. 416);

b. academic autonomy of teachers, as seen in experimentation, and institution of a critical comparison of ideas and opinions, which takes the form of interdisciplinary and collegiate work (DPR No. 417);

c. support provided by structures and organisations (even external), in the general work of research, experimentation and modernisation (DPR No. 419).

II. As regards the secondary school in particular

The second problem is inherent in the establishment of structures appropriate to the school's informative and educational function, and has several aspects:

a. the increase and extension of information to transmit; this confronts the school with a choice between reducing the number of fields of study and volume of knowledge, or indefinitely extending the time of transmission, ie the duration of schooling.

With regard to the number of fields of study, curriculum revision is planned to delete many concepts and data, particularly of the type requiring commitment to memory. With regard to volume of knowledge - and despite Bruner's finding that the increase in volume of knowledge goes hand in hand with the development of the structures organising it, and with an increasingly organic inter-relationship of its contents - the possibility is being considered of eliminating everything except general principles and concepts (science, after all, moves in the direction of generalisation, and that means simplification); at the same time, areas of enquiry and their related problems will be explored extensively on the basis of pupils' centres of interest and needs, by means of supplementary research and independent study. By balancing each other, the two actions of cutting down and expanding would provide a satisfactory preparation within a course of the present length.

Both proposals for secondary school reform and experimentation are moving along these lines, envisaging an area of study common to all pupils, including the national language, history, mathematics, one foreign language and other subjects regarded as essential to a basic education, which are to be explored and studied in terms of the needs expressed by pupils in the course of motivated research; at the same time, it must be borne in mind that some of the centres of interest and needs expressed by pupils will prove insignificant and infertile, and only those which are capable of removing doubts relating to contingent problems, eliminating attitudes of insecurity, modifying behaviour and making a positive contribution to personality growth should be used.

b. The school-work relationship is a focal point of the reform. Learning and knowledge are essential factors in development and as such they should be regarded as an investment, their object should be the demands of the working world. A conviction that secondary schooling must contain some vocational or at least pre-vocational elements - not specialised, for that would be undesirable, but a suitable foundation for subsequent specialisation - has led to a proposal entailing three groups of optional subjects branching off from the common core: philology-linguistics, mathematics-sciences, and history-sociology, which would in a sense be operational and practical continuations of the general basic education.

III. New elements of knowledge and new practices

A third problem, whose solution lies largely in the realm of experimentation, is that of the selection and introduction of the new elements rising over the horizon of a new education.

a. Difficulties of classification and co-ordination

For reasons mentioned above, it would be preferable to avoid introducing new subjects into the curricula. Moreover, only a few of the new elements would appear to have an originality potential great enough to warrant the creation of new subjects of study: data processing is one, the science that leads to the computer. In Italy, this was introduced into technical school curricula as a totally new subject, confined to two newly established courses. By and large, however, all elements of knowledge and practices, including those in the human sciences:

- are virtually covered already by one of the traditional fields (eg environment studies: the natural environment is studied in biology, the territorial one in geography, and the social one in history and civic education);

- or can be attached to existing fields by enlarging their area (eg the highway code, health, nutrition, consumer affairs etc are connected with civic education - this was introduced into curricula as a separate subject a few years ago, and could itself be identified with political education, or, to be more precise, could form part of a political education);

- or serve as instruments in developing aptitudes for communication and social integration (study of languages, work in small groups etc);

- or function as subsidiary instruments in instruction in other subjects (eg teaching technologies such as programmed or "mastery" learning).

It is not easy to classify and co-ordinate so many seemingly new and disparate elements (contents, methods, techniques, approaches). Just when one thinks one has differentiated among them, singly or by group, a glance at the goals they pursue merges and confuses them again, and we find ourselves back facing the principle of the unity of all knowledge and education.

b. Causes of this uncertainty

Several factors lie behind this difficulty:

- confusion in the human sciences themselves, which were initially divided into clearly differentiated areas (anthropology, semiology, psychology, sociology and political science), and are now in the throes of destructuring and restructuring as a result of the constant emergence of new elements, interdisciplinary postulates, and totalising tendencies which have upset institutional balances;

- the state of uncertainty in which teachers must work, owing to the recent transformation of their former role into something radically different: what used to be transmitters of learning are now manipulators of a system of knowledge and behaviour;

- the lack of a theory underlying their methods of research - if the term can be applied to static and one-directional research when it is not open to constant progress in numerous directions - the sine qua non of any research.

c. Factors of convergence

The truth is that the "new" must not be sought primarily in educational content - which is still, as it always has been in educational practice, a mere instrument differently employed at different times to achieve differing ends. On the contrary, the "new" should be sought precisely in those ends, which are no longer those of the traditional school and have only today (at long last, and perhaps as a result of the determination to explore the educational process in greater depth) come to be taken seriously and borne in mind as the process slowly and gradually draws closer to them. Those ends all converge at one final object: the education of the person and citizen, that is, a political education (a political education being one that provides a complete preparation in the polis or organised community, and hence covers all other educational objectives: ecological, social, ethical, emotional, functional etc, with their various foundations and implications).

In a political education two phases can be distinguished:

a. the intellectual phase, that of first exposure to the structure of problems and reasoning, which leads first to an awareness of problems and clear definition of them and later to the ability to solve them as well;

b. the socialising phase, that of co-operation and co-management, which leads first to a grasp of the concept of community and to responsible participation in the process in which one is a protagonist, and later to a more tangible participation in projects, programmes and decisions within a democratic community.

Thus there is a time in which every individual learns for himself (individualisation) and a time in which every individual learns within his group (socialisation).

At first glance, technology would appear not to form part of a political education; it serves it, as it serves every science, by providing tools with which to define programmes, choices and decisions, in the same way as it supplies the natural sciences with tools for controlling phenomena, ecology with means of directing phenomena towards the surrounding structure established by the community, and education as a whole with means of improving and controlling learning.

Introduction to communal life, acquisition of social and emotional balance, and integration into an organised community (one which obviously corresponds to the present technological or technocratic society but remains to some extent open to a relatively near although unforseeable future): these, as we shall see, are the mediate ends which have led almost all experimental schools to focus their research, in various ways, on the theme of communication. It has been treated in terms of languages, the interpretation of messages emanating from the mass media and from nature and the environment, the application of communication techniques, and experience with relationships.

Communication unites and catalyses every crucial moment of social life and offers the best possibility for adjusting human relations; it is therefore reasonable to suppose, research having begun with experiments involving relations between humans and the products of human inter-action, that the true dimensions of the school - at the community, social and political levels - have now been grasped, and the content to be embodied in the new school has been clearly determined.

Case Studies

Communication technology: languages and codes

(Biennio Unitario Sperimentale (BUS) (1), Reggio Emilia)

Description

The experimental group of Reggio Emilia has adopted a scientific approach to communication. Starting from the idea that the new educational technology should employ the widest possible range of communication languages, it proposes to analyse a number of them and then explain the social significance, function and power of each type of communication. Within the wider theme of "man discovering the world", the study of languages becomes a chapter in the history of science, ie the history of man, his development and his relations with other men and with the products of human inter-action (languages, behavioural technologies, thought and behaviour patterns). Communication thus takes on a scientific dimension and science a cultural and social one.

It would seem, from this emphasis on the human presence in every facet of nature and history, showing how people of different times and places have made similar adjustments to a similar environment and focussing on the interdisciplinarity of problems, the true community of man and the symbiotic relationships obtaining between different peoples, that the project was claiming that a European anthropology was a demonstrable hypothesis.

Objectives, background and development of the idea

Like almost all the other experimental courses, the BUS of Reggio Emilia hopes to make an original contribution to the creation of a modernised design for secondary education - both system and curricula - in response to the demands of society and new occupational profiles. It also hopes to contribute to the formation of a new design for human beings - endowed with open and scientific minds, capable of posing problems, critical, inventive, and able to invent valid cognitive, expressive and operational tools with which to interpret reality and communicate with others.

The problem of modernisation is not only political; it is cultural as well. If the motivation to solve it is to remain strong, more will be required than the resources of single subjects of study or the establishment of co-operation within the schools: complementary inter-disciplinary relations must be set up between the school, the educational experiment and social reality.

(1) The "biennio unitario sperimentale" corresponds to the first two years of upper secondary school.

Aware of the difficulty of co-ordinating the many elements of knowledge and behaviour offered by the actual world and its innumerable problems (which appear to be distinct and yet are always correlated and reducible to a single substance) into one organic image of learning, the teachers at Reggio Emilia have sought a solution by relating all elements and problems to a single line of research.

As a body, they accordingly worked out a multidisciplinary technique; this does not consist in approaching a subject from every conceivable angle, but in asking every subject to make a contribution that will help to throw light on some particular theme.

Method

The first step towards an interdisciplinary method was for every teacher to conquer his temptation to give top priority to his own subject and bury himself in his special field.

From the viewpoint of teaching, interdisciplinarity is conceived as:

a. concerned with methods, not contents, and to be extended to the specific subject-matter of different fields only when so required by an investigation of the problems of a given subject (thus as a constant co-ordination between teachers in relation to the single objective which imposes unity of object and method);

b. the product of a group effort, calling for carefully programmed teaching and investigation in many directions.

From the viewpoint of the operative structures of thought or learning, it is composed of the following:

a. testing of the reality already possessed by the pupil, and identification of gaps in it, leading to psychological dissatisfaction and cognitive tension, or stimulation for research;

b. individualisation and definition of problems;

c. mastery of an inductive process of observation, analysis and synthesis.

Content and organisation of the experiment

Predictably, work on the subject "man discovering the world" leads to problems which are common to many fields (biology, human and economic geography, anthropology, sociology, political science, history, history of science, art, literature). The subject is also suitable for treatment outside the classroom and can stimulate research activities relating to nature, society, cultures and sub-cultures and inter-relationships. At first it is approached as a whole, then split into sections, the first two being more closely connected with scientific education and the next two with literary and artistic study.

- The first section, "man asks", expresses human anxiety throughout history; in a rapid survey of the centuries, science and history are closely associated and an approach to cultural anthropology is made;

- the second section, "science as an answer", is intended to give a rational view of nature, and brings observation into play, along with texts relating to scientific research;

- the third section, "art as an answer", the search is seen, on the contrary, as a lyric vision of the world, supplemented by visits to monuments, museums and exhibitions; pupils listen to music and poetry, read literary and documentary texts, view photographs, montages and recordings;

- the fourth section, "religion as an answer", deals with the fantastic and irrational dimension as a response to man's existential anxiety, and leads to an approach to psychology and a few attempts at introspective analysis.

All the phases of this experiment cannot be condensed into a few lines. However, the path followed by language analysis deserves attention: an introduction to the different symbolic codes, although general, is presented simultaneously as an object of learning and hence a new element of knowledge, and as a tool for facilitating interpersonal relationships at every moment of social life.

The research begins with linguistic, grammatical and syntactical observations related to the study of the national language, and still in the context of that subject, moves on to an analysis of literary language presented as a particular type of language not governed by the law of exact correspondence which characterises all other forms of communication.

In literary language the relations between signs are more important than their contents and, as in art, even imaginary elements - in contrast to historical and biographical truth, requiring faithful replication and logic - become functional.

In the same way, consideration is given to the technical and ideological characteristics of other languages, those of the sciences, mathematics, history (this also makes for a fuller understanding of those subjects), of politics, bureaucracy, technology and visual languages (which have now come into social usage) - so that they too may be read and interpreted. Any form of language, like any ethnic tongue, has grammatical and syntactical codes which (especially the latter) give coherence and reality to its discourse.

In opposition, however, to the well-known thesis of Chomsky (whose "communicative aptitude" means the mastery of an ideal linguistic condition and a knowledge of the basic laws of speech and inter-action of symbols), the Emilia group appear to support the contention that grammar and syntax can undoubtedly improve communication skills but cannot be translated into an act of communication unless associated with social content, and unless, in formulating propositions, the "transmitters", "speakers" or "scriptors" take into account certain elements of propriety, suitability and capacity for adaptation to the circumstances in which the message is transmitted, the implicit intentions of the message, the audience to which it is addressed and those who may make use of it.

Possibly prompted by an ever more acute sense of the need to do so, the Emilia group is concerned to explain the meaning of the word communicate (to render known, to share thoughts, ideas and feelings with whoever is listening), to go through the different systems of communication (language, gesture, sign, symbol), isolate the elements of the act of communication (what is said, to whom it is said, and who actually does not perceive the message), and look at the context in which messages are transmitted.

There is nothing surprising in the fact that a group of teachers should seek to focus attention on the languages in which communication takes place and their functions in society. The project of the teachers in Reggio Emilia

must be the fruit of long experience in the school, of frequent observation of the difficulties encountered by pupils when they are called upon to interpret literary, artistic, audio-visual or journalistic messages (for which they are not, moreover, the audience intended by the authors of those messages) without assistance, and of their experience of reactions in which their pupils were the victims or the involuntary offenders in an era in which they must daily face new relationships within the school, alone and unaided.

Assessment

The following have made a positive contribution to the success of this experiment:

- the combined determination of teachers and pupils;
- the presence of a homogeneous group of qualified teachers;
- the epistemological approach (which gave support to the interdisciplinary work);
- the adoption of methods which had already been tried out;
- meetings with teachers from other schools, to exchange experience;
- favourable conditions offered by the premises.

In terms of the growing interest with which pupils have followed the experiment, it may be called a success, although not, of course, in terms of results which cannot be judged after so short a time.

Even though no immediate assessment is possible of this experiment which has tackled a new subject in strictly scientific terms and adopted new methods and practices, however, the very effort to reach beyond traditional experience and the undeniable development of an experimental and critical approach are positive elements.

Mass communication - the audio-visual message

(Biennio Unitario Sperimentale (BUS), Rome)

Description

The experimental group in one Roman lycée is approaching the subject of communication from an essentially psychological point of view. It aims to interpret the audio-visual message through its structure, which is just as complex as that of written language and has a no less persuasive rhetoric. The originality of the experiment lies in a gradual and almost imperceptible narrowing and deepening, with the result that the message is interiorised by the subject analysing it.

At first glance this experiment would seem to be centrally concerned with the theme of mass communication (reading and interpretation of still and moving images in press, hoardings, films, television etc), but in reality it embraces many socio-psychological aspects of communication, by virtue of the following:

- image interpretation takes place in groups which are sharing a common experience (every instant is thus an opportunity for exchange of opinion and evaluation, agreement and discord between members, and accordingly provides favourable conditions for increased socialisation);

- the teacher is also present during the experience; he is an active participant in the investigation and stands in a new relationship to the pupils, based on acceptance and respect for their opinions and personalities rather than on authority and cultural superiority;

- the pupil is no longer asked to perform an external reading and interpretation of the image presented to him, but to read it within himself, to become aware of himself and his own inner structure, of what has been taking place inside himself in the past and continues in the present - in short, to communicate with his "self".

Background and development of the idea. Objectives

A course in the language of still or moving pictures could form part of the additional activities programme which, in the modernised secondary education, will supplement the compulsory and optional courses. The course was offered to pupils in the "Biennio Unitario" as one of several, and was freely chosen by them.

It is inaccurate to speak of an introductory education in the language of images, for the reception of audio-visual messages, even wholly unstructured, begins in early childhood. Using appropriate stimulation techniques, however, the experimental group in Rome wanted to quicken and intensify a process which is by nature endogenous, supplying the needed help and guidance to promote both an awareness of personal interpretation patterns and, at the same time, psychological maturity and a keener critical faculty.

Contents, methods and organisation of the experiment

The programme is divided into two periods, scientifically and from the viewpoint of method as well as chronologically.

1. At first only still pictures are used, so that the group can all analyse the same photograph at the same time. The "iconic" phenomenon of communication has been observed: the signs resemble the object being represented or signified, but in three-dimensional representation and in perspective it is seen to possess its own symbolic code;

2. Then, turning to moving images, the experiment entered the field of the psychology of perception and representation as an interiorised imitation of the outside world; from there it passed on to an investigation of the origin of thought. The study made some use of the psychology of Piaget and the psychoanalytical theories of Freud and Kohler, as well as to behaviourism (in so far as that approach seeks to reconstruct the itinerary followed in progressing from the tabula rasa of the newborn child to the "complex painting" of the world created by the adult).

The course was given to two groups of 20 pupils each in the first and second year of the "Biennio unitario"; those in the first group were 14 and those in the second 15 (there were also a few 16- and 17-year olds from the "Triennio" course).

It was run by a literature teacher, new to both classes acting as socio-cultural animateur and mediator between the instrument of communication and the pupils, and a technical assistant versed in the use of audio-visual equipment. On several occasions in the course of the experiment, however, other teachers were called in to provide an approach to the human sciences to help with the study of the forms and spatial positions of figures.

Assessment

a. Bio-psychological comparison and general effects

Pupils attained varying degrees of maturity; with regard to the rationalisation of interpretative structures of images in particular, there was a marked difference between the 14- and 15-year old groups, but no difference between the latter and the few 16- and 17-year olds in their group.

b. Effectiveness of audio-visual aids and educational attainments

By establishing a connection between the world of images, the senses and speech itself, the audio-visual aid is implicated in several sensory routes during the learning phase, and has a positive influence upon it.

Gradual progress was observed during the experiment, in the following areas:

- the ability to distinguish between different types of image with increasing rapidity;
- the gradual transition from observation and description to reasoning and criticism;
- eventual progress beyond superficial and total judgements;
- use of increasingly appropriate terminology to discuss images;
- increasing awareness of personal sensations and reactions;
- a change in the mode of judgement (highly personalised at the outset) and definition of uniform guidelines for interpretation.

c. Personal relations and socialising effects

The young people shared a group experience in pursuit of a definite objective, comparing their views with those of others, receiving and emitting stimuli, learning and teaching, evaluating others and themselves. The interest of the work lay in the multiplicity of interpretations and opinions and in the atmosphere of healthy democratic pluralism in which discussions took place.

d. Transfer and carry-over effects

The teachers in certain classes observed a positive result from this study in their own special fields:

- language: greater ease of expression and a richer and more specific vocabulary;
- art: increased ability to analyse;
- natural sciences: use of visual information;
- chemistry: new interest in developing and printing photographs;
- mathematics: a more precise approach to problems;
- physics: mastery of questions of optics and electricity;
- behaviour: more definite ability to communicate.

Conclusions

As this type of course will remain a freely elected additional activity, or at most be used as a support for some other educational act, it will presumably be possible to maintain the enthusiasm typical of non-compulsory work, and to arouse as much interest in future as was displayed by the Roman classes throughout the experiment.

Communication in the environment: the messages of phenomena

("Biennio Unitario Sperimentale" (BUS), Milan)

Description

The experimental group in Milan approached the theme of communication from the veiwpoint of ecology; research carried out in nature (analysis of pollution) and human communities (enquiries conducted locally and elsewhere in the city) led to an understanding that a world founded on communication and co-operation was one of the conditions for the survival of humans and social groups.

The Milan project began with the idea that the word "environment" meant more than woods, fields, sea, nature in its original condition, and more even than the city: it also meant mechanised nature, ie the electrical plant, gas, radio, cinema, and airplanes produced by man. It must include not only things, but such phenomena as the population increase, food production, over-production, the exhaustion of resources, pollution. In short, the "human environment" includes everything around us and everything which is produced, developing, and being expressed around us. All these phenomena speak to us, transmit messages which we must interpret, present problems calling for thought and a search for solutions. As a result, they also act as mass-communication transmitters or media provided by the action of nature or man, and a dialectical relationship must be established with them.

But when it is shown how the man-nature and man-environment inter-action inevitably leads to man's relationship with other men, the ecological problem itself assumes a political dimension, because it is human communication which is called upon to produce the factors of balance conducive to a better world.

Reasons for the choice and objectives

As a means of achieving an integral education of the individual and citizen, the Milan BUS chose ecology, a science which brings together all other sciences dealing with man, and which can combine scientific and social centres of interest. The purposes of showing the great variety of factors which can disturb the environment and the complexity of their inter-dependence were, in concrete terms, to promote a more active and shared awareness of human responsibility for bringing about a reasonable management of the environment, to stimulate an attitude of

criticism and even protest with regard to the dangers of manipulation and subservience, and to establish that the present determination to revive ethical values is meaningless unless it flows from a social effort.

Development of the idea

Environmental studies were introduced as an inter-disciplinary project.

The idea was developed in class councils, in which the pupils took part, after being offered the opportunity to propose other projects. The procedure was as follows:

a. a sphere of common interest was defined, within which the project must be designed;

b. the place this type of work would occupy, in relation to the regular curriculum, was defined;

c. a general programme was worked out;

d. the class, calendar and timetable were adjusted.

This was followed by a period of study and discussion, with class representatives taking part, leading to the following decisions:

a. the theme of pollution was chosen by the majority; it would not be treated in abstract terms but in reference to reality and the city of Milan in particular, and by means of an on-going relationship with the environment;

b. 4 afternoons a week would be set aside for research, and a certain number of morning lessons as well, to provide a background, for the research;

c. the interdisciplinary work was set up along lines corresponding roughly to the two main sub-divisions of the new secondary education course: a scientific and technological division and a socio-historical division. The language and expression courses are common to both;

d. setting up the project led to a few changes in class organisation, as working groups were formed to situate the problem of pollution within a wider framework:

- man and nature,
- man in the city,
- man and human relations.

Methods

The classroom lesson was replaced by research and direct control of the material studied.

The following instruments of research were used:

- reading, which supplied preliminary scientific and historical information needed to situate problems exactly;
- observation, of clearly-defined situations and objects, static or moving, or of behaviours - that is, individuals in action;
- interview, which was primarily intended to probe centres of interest, opinions and judgements.

Contents and organisation of research

The choice of pollution as the theme for research was treated as of secondary importance and did not restrict the field of enquiry, on the ground that all problems of concern to people belonged to a single reality and had a bearing on one another. Thus, beginning with pollution, the group moved out to look at all the key questions affecting humans: food, consumer affairs, use of resources, over-production, health, preventive medicine, social prophylaxis, protection of employment, accident prevention, town planning, emigration, road traffic, mass communications etc.

The group in the scientific and technological division concentrated on phenomena more closely bound to nature, and isolated the major causes of air, water and soil pollution and their harmful effects on humans and ecosystems paying special attention to the disruption of biological equilibria and their effects on crops and stock-raising. The group then made a careful survey of reclamation systems; they were encouraged to look for every possible form of defence rather than succumb to fears of catastrophe. They, also observed that a polluted and noxious environment was not the only one, and that a nature filled with colour and sound also existed. The problem of ecology involved sensory stimuli and a feeling for nature as well: savouring the beauty of a landscape, beyond any thought for the dangers or advantages it may contain from the human point of view, is a means of safeguarding the senses and emotions against sterility, deformation and atrophy.

The study of the natural environment, involving the teaching of biology, chemistry, physics, economic and human geography and art, led to the following conclusions: rather than indicting technology, we should transform our attitude towards nature and re-establish a fresh mutual relationship with it, combining socio-economic, bio-psychological, aesthetic and cultural interests.

The group in the socio-historical division looked at phenomena more closely related to the individual, groups, and interpersonal relations. Transposed into an urban setting, the problem of pollution took on a dimension that was at once social and ethical. The young people began their enquiries in the different districts of the city (each in a district of his choice) and looked at their most significant elements: dwellings, streets, schools, building-sites, welfare facilities, shops, leisure gathering-places etc. By communicating with the environment they were able to set up comparisons between the privileged industrial and tourist areas and the deprived districts of slum and hovel. Sharp observation revealed the precarity of the situation in some areas: no gardens or parks, poor-quality dwellings, failure to comply with health and safety rules. Group discussion of reports brought problems into clearer focus, altered personal interpretations, and expanded conclusions.

After the observation period, the group moved on to interviews, which provided another opportunity to think about the problems of unemployment, poverty, loneliness, and frustration, and to acquire a more realistic attitude towards the environment, in terms of both interpretation and action.

Comments on method

The interview might be an excellent tool for the interpretation of realities if it were not impeded by problems of unsatisfactory communication resulting from the individual's instinctive reluctance to speak out combined with the youth of the interviewers, who had no idea how to proceed. To avoid this kind of reluctance, whatever its source, the following are recommended:

1. the interviewer should not be a total stranger to the interviewee;

2. the interview should be arranged in advance and the interviewee's consent to this form of co-operation should be obtained;

3. an outline of the subjects to be covered in the course of the meeting should be prepared ahead of time, but not in the form of specific questions, and the meeting should be a relaxed, friendly and fruitful conversation, not a third-degree grilling;

4. the interviewer should respect the privacy of the person he is talking to, unless he is someone of the same age and in a mood for confiding;

5. the interview should be seen as an exercise in communication, more than a piece of scientific research. In this type of interpersonal relationship the problem of communication becomes central, as both parties are employing language at the level of emotional implication as well as that of conceptual meaning.

Assessment

The interdisciplinary approach based on a graduated method stimulating to both intellect and sensitivity produced effective co-ordination in respect of the following:

- the personality of the pupil (which should develop in a well-balanced fashion),
- culture (which was presented as an organic whole, not as separate units),
- method (which was based on a unified approach to observation, reasoning and expression),
- the school community (which worked in a spirit of uninterrupted and harmonious co-operation).

The technique of participation enabled pupils to be present during the learning phase, to feel the joy of discovery and become aware of their own share in the historical and social processes, and helped to give them lasting knowledge and a real, concrete civic education.

Environment research is not a novelty for the school; in the past, however, a problem of ecology such as pollution was viewed as a centre of interest capable of leading to many interdisciplinary references and developing an understanding of the need to preserve the structure of the environment, whereas here pollution was presented as an ordinary subject of research, liable to constant change in accordance with the many messages coming from the outside world which, although part of life would not have been received, and possibly gone quite unnoticed, without this positive movement towards them.

In the messages transmitted by the environment, the young people were encouraged to find the age-old human activities of which they are the heirs, an adult experience, a discovery of themselves, and an intimation of the struggle that lies ahead for them in the creation of a better world.

Communication within the school community and with the outside world

(Experimental centres of Arese, Cermisco sul Naviglio, Casalpusterlengo, Besana Brianza), Milan.

Description

The Lombard centres' experimental groups have placed the theme of communication on what might be termed an ethico-vocational level.

The teachers have plainly been convinced that in the present crisis of society it is people and not things that need to be changed and therefore, in education, the technology of learning rather than that of teaching, which is only a secondary (and often sterile) instrument. They also seem to have understood that the quality of teachers must rise, before the young people they teach can improve. This experiment was conceived with that end in view. When the time came for teachers to try out group work techniques on their pupils, and guide and direct a group of young people in this new type of relationship as a prelude to broader forms of social life (and of autonomous and responsible action in the community), they appear to have paused to consider that it would be well to apply these socialising techniques to themselves first, by developing in themselves that ability to communicate which is essential to active community life and which entails the comparison of opinions, dissipation of antagonisms, seeking of agreement or compromise, acquisition of an open mind eager for understanding and fellowship - in short, the capacity to live with other people and keep the good of all in mind at all times. In the class councils they accordingly set up a new form of organisation and self-management, involving self-centred group work (autocentrato) and, by trial and error, reached the conclusion that it was absolutely necessary to communicate with the outside world, to bring about a symbiosis of groups, a constructive fusion of school and society.

Objectives - background and development of the idea

In addition to the stated goal of the "Biennio Unitario" - to guide pupils in the discovery of their aptitudes and counsel them in choosing the area of their future integration in the working world - the Lombard

experimental group decided to incorporate a socio-political objective, ie to accustom the pupils to live and work together and become actively involved in running the school within the educational community, with a view to their future integration into a larger democratic society.

In reaching their decision to use group work techniques in class councils, the Lombard teachers:

- became aware of themselves as a group and of their educational effectiveness as a group, which was greater than when they worked singly, as experts in separate subjects;

- realised that there was no way for them to become effective group leaders except by mastering group techniques themselves;

- came to see communication as bilateral, not confined to the teaching-learning relationship but extending to every other type of relationship: between pupils, between teachers, between teachers and pupils and between the school and socie'y.

Their experiment in the communal management of the school, in pursuance of DPR No 416 of 1974, consisted in exploring group work at different levels (organisation, methods, emotional involvement) and in working out new roles, relationships and model school communities.

Structure of the school community

The structure of the four Lombard centres differs in a few respects from that laid down in DPR No 416, either because they began to experiment before the decree came into effect or because those few years of experience led the centres to make certain gradual changes in the structure of the collegiate bodies. More important than the structural adjustments, however, were the criteria underlying their research in education and management, which led to the adoption of specific positions: the assignment of tasks and responsibilities to everyone involved with the school (pupils, parents and teachers) and the ensured extension of participation to local bodies and all forces of society.

Organisation of the experiment

At the outset, the group announced that it would be managed independently, and undertook to replace authority by participation in the form of an assembly with pupils and parents. This anti-authority position went hand in

hand with a gradual isolation of the experiment. Within the community chaos reigned: the young people, faced overnight with adult problems and responsibilities, reacted more destructively than positively: parents either failed to attend assemblies or came only to foment protest; and teachers were suspicious of any form of authority and could hardly tolerate a moderator at assemblies, with the result that everybody took decisions and nobody carried them out. The pupils' work suffered, because there was no longer any reason why they should do it; for them the only reminder of reality lay in the prospect of the 3-year course, still organised on traditional lines, which they would enter at the end of this experimental 2-year programme.

Once this inevitable period of disintegration was over, the experimental centres realised that group work could be productive only if its motivations, action and the assessment of its results were subjected to some reality external to itself. The problem then became to find this reality, which must replace the one previously represented by the school authority; ultimately, the idea emerged of referring work to the evaluation, judgement and criticism of an authentic interlocutor: the local population. The acceptance of this addressee-judge, the recognition of its presence and structuring function, soon led to acceptance of internal authority and the distribution and assumption of responsibilities.

Thanks to the creation of direct communication with the social forces at work in the town, communication gradually became the peak and decisive element in both the educational aspect of the experiment and the communal management scheme; work done in school was no longer an experience confined to the members of a group, but became a fact whose results could be measured and assessed.

Content

The Lombard experimental group decided that the experiment should cover all three areas in the secondary reform plan:

- common basic course,
- optional subjects, and
- additional free activities,

and that the interdisciplinary research projects designed to enlarge upon and extend work in the basic subjects should follow substantially the same lines as those laid down in the texts, ie a scientific and technological division and a socio-historical division. This experiment added a third line, however, called "education in communication".

What is the most appropriate means of communicating with the outside world? The question is irrelevant; it might be a newspaper about school life or culture, a theatrical performance, the findings of a piece of research, or the printed or stencilled presentation of the results of a survey carried out in the town. Whatever the work, it will always be done by a group in which each person will make some contribution, no one will be the protagonist, and all will be on the same level and equally essential - just as in life, anyone performing a function, however lofty or humble, is essential - and all will be equally responsible for the final product. Knowing the audience for whom their message is intended, the young people found motivation for study, research, the working out of hypotheses and solving of problems, and everyone tried to say something useful. Reference to the outside audience became a continuous source of stimulation, creativity and initiative.

Methods

As said before, preference was given to the interdisciplinary research project as a teaching method. Since the subjects of research were problems of human relations, inter-personal relationships, institutions set up to perform particular functions and individuals invested with particular roles and powers, the approach inevitably involved a socio-political aspect. Subject choices were guided by teachers when pupils were strongly motivated. The objective was clearly defined and its achievement organically planned. Although the group still shows a tendency to emphasise some particular subject, exert undue influence on choices, and adopt a consistently scientific approach towards the organisation of work which is closer to an adult mentality than to that of the pupils, all the teachers have tried to adapt to the new democratic forms and all are convinced of the need for pupils to regain creativity and spontaneity.

Notes on cost

93 teachers took part in the experiment; 48 were seconded from other schools and 45 were appointed as assistants by the Director of the Technical-Commercial Institute to which the centres are attached.

Total expenditure was as follows:

- lire 79,046,638	for teaching staff
7,100,000	for teaching aids, technical and scientific equipment and laboratories,
18,700,000	for auxiliaries (canteen, transport, textbooks).

Assessment

When pupils move from "Biennio" to "Triennio" they return to a course which is still organised along traditional lines, or in the earliest stages of modernisation; it is accordingly impossible to verify the results of the experiment in the upper course. Furthermore, objective criteria for verification of results in terms of goals have still to be defined, for the overall general and vocational education plans are still uncertain.

This being the case, there remain only the intrinsic criteria for evaluation of the educational effort; the Lombard experimental group has investigated these at length, although it is not completely satisfied with the results.

Teachers and pupils co-operate at every phase in planning and supervising both group work and individual progress in relation to the pupil's initial situation; progress is recorded on individual observation cards.

Leaving aside the lack of external testing criteria, the work has in any case become more firmly oriented.

Information and data processing

("Triennio" of the Technical Institutes)

Development of the idea - objectives

Data processing is the only new element whose introduction into the present school system has produced a new field of study - and even then in a very limited area, involving only a few sections of the technical institutes.

The ministry of education received various requests from industry relating directly to the vocational field and the demand for qualified staff to co-operate in teams in computer centres. The ministry decree of 28 January 1972 instituted a new "branch of specialisation for public and commercial accountants and programmers" in commercial technical institutes and a new "branch of specialisation for data processing" in industrial technical institutes. The teaching of data processing on a very limited timetable has also been introduced in the fourth and fifth years in vocational institutes, previously established by an Act No 754 of 27 October 1969, to supplement the regular 3- and 4-year courses in preparation for the proposed 5-year secondary reform programme.

The motivation and objectives here are thus distinctly vocational: the training of cadres, and particularly specialists for the technical-commercial and technical-industrial sectors.

Contents and organisation

a. The accountants', commercial experts' and programmers' sections emphasise "management and administration" subjects and have handled the programme smoothly by adopting a system of combined instruction in the special subjects of the commercial sector (political economics, finance, economic statistics, mathematics, probability calculus and statistics) and in specialised fields (accounting and technique, applications of accounting and calculating machines, automatic processing of data). In the final (fifth) year, exercises in programming, compiling and proving refer to programmes carried out during the previous 2 years, which occur at regular intervals and include trips to electronic centres. Results were satisfactory, in that pupils proved adequately prepared to solve organisation and management problems.

b. The industrial technicians' sections initially intended to concentrate on technical and constructive aspects, in terms of the profile of a technical expert in the programming of industrial processes; later, for various reasons - not least of which was the large and persistant demand for personnel emanating from the administrative sector - they decided to ally themselves more closely with the approach followed by the technical-commercial institutes. As a result, the specialisations and very configuration of this course have become blurred.

Material for the automatic processing of information

In April 1974 and June 1975 the ministry of education made a survey on the distribution and use of computers with a view to obtaining a foundation for a more organic employment structure. This produced the following results:

1. distribution

- technical-commercial institutes: 86%
- technical-industrial institutes: 34%
- vocational institutes : 14%
- all other schools : 14%

2. use

- digital computers	:	in teaching and running the school
- analog computers	:	in process simulation
- time-sharing and desk-top computers	:	uses very limited for educational purposes

Assessment

From the legal viewpoint: the absence of a legal status and salary scale has complicated the appointment of a director for a computer centre and the hiring and payment of programmers and operators having specific skills, and led most qualified people to move into the private sector.

From the financial viewpoint: experience in other areas of national activity has shown that automatic data processing does not develop unless qualified persons are available locally; otherwise, the expense in time and money reaches unforeseeable proportions, and small computers remain virtually the rule.

From the viewpoint of staff: the training of teachers has been found inadequate at both technical and pedagogical levels. Thus far initial and in-service training in data processing have been provided by the Organisation for the Preparation of Teachers (OPPI) and Centre for Educational Innovation (CIE). Once data processing enters the life of the school, however, computers will plainly require far more attention in all in-service training.

From the viewpoint of use and profit: in 70 technical schools computers were used only for specific teaching purposes and virtually no use was made of CAI and CMI systems or logic laboratories. The pupils, as programmers but not users, were unable to exploit the full educational potential of the computer, in: the cultivation of organised thought, symbol mastery, discovery of structures and relationships, and aptitude for reasoning. Whatever qualitative progress has been observed derives from the fact that the introduction of any new element is an enrichment, or at least a foretaste of a new aspect of learning.

From the viewpoint of the environment: at first the computer sections, inserted into educational structures which had no interest in the problem of data processing, remained isolated. The first step towards a new awareness came when other areas of technical education turned their attention to the computer and realised how much help it could give in solving urgent organisational problems. The steady rise in the quality of computer centres aroused interest in the outside world, although this has not been equally true of all the institutions involved in teaching data processing.

From the viewpoint of pupils' interest: once pupils were removed from the machine they were observed to lose their initial enthusiasm for data processing, because their attention had been captured by the machine itself, rather than the field of study associated with it. For that reason pupils should be introduced to the science of information treatment before coming to grips with the computer itself.

Prospects for data processing

Analysis of this experiment has shown the desirability of revising the principles of technical education, as the system of data processing can provide an excellent solution for its problems of organisation, administration, training and teaching.

The question has also been examined as a whole in relation to the following:

- secondary education reform,
- the prospects offered by the enabling decrees,
- experimentation.

1. As regards the secondary education reform

One objective of the reform which has been accepted by all democratic political forces is the elimination of the discrimination created by private channels of specialised education which provide a basic cultural input and favour subsequent development. Whatever the new secondary school may be, it is certain that specialised training in it will be founded upon a more comprehensive basic education. Elementary data processing itself, that is, a general familiarity with the three dimensions of the science of information (information, education, evaluation), should be one of the subjects in the compulsory curriculum, which can then be enlarged upon and studied at greater depth on a voluntary basis; as a specialised course, it should also be included in the options section.

2. As regards the enabling decrees

By setting in motion a radical modernisation designed to produce a more democratic education and society, these decrees have raised many problems of organisation and administration. Communal management must be established, involving many different organisations and necessitating a constant flow of information, and thus the formation of a regional data bank. Furthermore, the texts have extended administrative autonomy - which used to be a prerogative of the technical, vocational and arts sectors - to the entire school system. New machinery will be needed to provide satisfactory technical solutions to the problem of adjusting human and other resources to this new autonomy in decision, administration and finance. The most appropriate system would appear to be based on the following:

a. creation of more extensive computer centres,

b. terminal linkage of schools and other organisations interested in the centres,

c. connection of regional units to a central computer.

With such a system, well-equipped centres could be established and the available human resources concentrated; information and control requirements could be met, and the electronic computer could be used in teaching, training and refresher courses. Ensured uniformity of procedure would simplify administrative operations in individual schools, financial resources could be rationally deployed and the system would constitute a step in the direction of organisation.

3. As regards experimentation

A number of technical education centres have been selected throughout the country, their resources have been increased, and it is planned to link them by terminal to different schools in their regions. They will be used for a series of experiments relating either to teaching or the automation of administrative services. Budget and salary arrangements have already been made; matters of inventory, secretariat, library etc are in the planning or drafting stages. Teacher training programmes are also under way, by means of courses in the technical institutes' computer centres; some of these should lead to teaching experiments in basic data processing. Experiments have also been put in hand in some schools.

The establishment of an automatic data processing system capable of meeting the demands of teaching and education will require full exploitation of all the experience now being acquired by schools.

Machines and men in educational communication

Experimental schools which have tackled the theme of communication from the technological point of view are few and far between.

The technical institutes might have done so - but they did not - by making use of computers in teaching (pupils might have been allowed to use computers in problem analysis, invention of algorithms, and work with formal languages). In Italy, the technological innovation can really be said to have taken place only on paper; one reason for this is that so few teachers have been equipped to understand the new languages, but another and more important one is that the limitations and inadequacies of educational technologies have been brought to light by the very people who were initially most enthusiastic about them. Programmed learning cannot be readily introduced into educational practice because there are not enough programmed sequences available in the various subjects and at different academic levels. Those who have managed to master programming techniques have preferred to use them in other experiments in individualised teaching, eg experiments in mastery learning.

The language laboratory, which in recent years has entered upon a new phase of specialised use, has proved to be a static and cumbersome instrument unsuitable for the motions, gestures, expressions and other extra- or para-linguistic elements capable of inciting the pupil to learn or leading him into a true process of communication by means of emotional involvement. Similarly, where audio-visual aids are concerned (now supplemented by closed-circuit television, television cameras and video-cassettes), perfection of transmission has been found to be of secondary importance, because the educational substance of the lesson lies in the programmes, contents and educational discourse, and it is these which need to be improved. The truth of the matter is that the machines are useless without the material that brings them alive and gives meaning to them. In the end, although technological advances have limitless power and the machines themselves still point the way to the safeguard of human values and dignity in a society determined to rely on those values and work towards humanitarian ends, what we need are men, not machines; this will be the goal set for the youth of future generations.

After this account of work in communication and the languages in which it takes place, mass communication and the communication of phenomena, communication within the school community and that between school and society, and communication with others and with oneself, it remains to say a word about one other form of communication, that extremely delicate relationship (the pivot of all learning) between teacher and pupils.

As we know, education is a form of two-way communication. On one side there is the teacher who transmits information, arouses interest, develops capacities, assists in structuring intelligence and moulds the young person with affection; on the other, the person who learns, exhibiting features of maturity and developing responses. Teaching initiates learning, learning completes teaching. To establish a relationship in which learning can take place, teaching must not be an empty monologue; it entails a constant awareness of what is actually being transmitted, and a constant check. In this connection, the theory of information and cybernetics offers a good model for feedback. The teacher communicates more than information: advice, suggestions, and responses to expectations, demands and aspirations - even when unexpressed and unconscious - which he must strive to understand and bring to light. This aspect of his work cannot be replaced by any technology. Educational technology is one thing, and the technique of educating, or the science of teaching, is another.

This brings us to the problem of training teachers, both before and during service. An innovation was made in this field by DPR No 417 of 31 May 1974, on the legal status of teachers; it established a new basis for the recruitment of teachers by instituting a course in theory and practice, between the written and oral examinations in competitions for teaching jobs, designed to assess vocational preparation and personal aptitude. This is a first step towards a structure resembling that put forward in the 1972 James reports, entailing a comprehensive training system in which recruitment and continuous further training were integral parts. Further provisions relating to in-service training are contained in Decree No 419 on experimentation, educational research and the further training of teachers.

A teacher needs more than a knowledge of his subject and some elementary notions of teaching techniques or the use of modern technological instruments. In addition to innate stability and common sense, he must also have aptitudes and feelings which he can acquire only through a relationship of emotional involvement with the pupils.

In this respect, both university and teacher training and refresher courses, whether in theory or practice, are useless. There is talk of setting up teacher training centres; but who will we get to teach the teachers? In our opinion, the best people to teach teachers are pupils. Teacher training takes place in the classroom, just as a surgeon learns in the operating theatre and the barrister at the bar. And if he has not learned at the end of a year or two, he probably never will. That is why there are poor teachers, poor surgeons and mediocre barristers.

Teaching others becomes a process of teaching oneself, for in every young person to be educated the teacher can find large parts of himself, and can recognise, judge and amend them. Educating others may be psycho-analytical, but it is also educating oneself. The teacher need only listen without prejudice, resistance or rebellion, to the languages of young people (which are of necessity immature, partial or even provocative), consent to join in a dialogue, put himself on the same level as his pupils - and not only because he wants to appear approachable and to understand, but so that he can transform himself in a process of continual self-education.

With regard to the teacher-pupil relationship, the point of departure for a new education should not be the transformation and perfecting of resources and methods, as much as the inner transformations performed by the teacher sincerely and with application, in his search for ever deeper and more human self-fulfilment.

Summary and conclusion

It would require a total mastery of the art of communicating to condense a vivid description of empirical creative processes into a few words without eliminating information necessary for effective representation and correct interpretation of results, and without making generalisations about particular and even atypical situations. In view of the variety of agencies, demands, motivations and contexts, the cases described here would not seem to offer any basis for generalisation, possibly not even at the level of this one country.

Innovations have tended mainly to result from the search for new arrangements and structures at the upper secondary level, and this has quite naturally concentrated on the "Biennio Unitario" which is its first phase.

In seeking to solve the special problems of basic education and guidance of the BUS, the experimental schools have paid little heed to content. The chief innovation has been a change in objectives and in the school's relationship to society, and a determined effort to forge ahead without losing sight of these aims.

We have tried to bring the five experiments together on the basis of one element which is common to them all; this would appear to be the theme of communication, some aspect of which arises in every instance.

The elements they have and do not have in common may be diagrammed as follows:

	New elements	Approach	Area	Method	Factors affected
Reggio Emilia	Communication technology (study of languages)	scientific	common trunk	multidisciplinary	- agents - work
Rome	Communication technology (audio-visual language)	psycho-analytic	supplementary	multidisciplinary	- agents - work
Milan	Ecology (pollution)	scientific	common trunk	interdisciplinary	- agents - work - product
Lombard centres	Political education (communal management)	socio-political	common trunk	interdisciplinary	- agents - work - product - outside audience
Technical institutes	Data processing	vocational	At present : common trunk basic data processing. Planned : optional data processing	single subject	- agents - work

The main features common to all experiments are the following:

1. new organisation of studies implying the co-operation of all teachers in a communal effort;

2. active participation of pupils in teaching as well as learning and in running the school;

3. experimental control of teaching-learning processes.

The essential elements in the new organisation of studies were the human and social sciences, not added to curricula as new subjects to be treated in abstract and theoretical terms, but as the foundation for the new interdisciplinary approach, as means of learning about human nature and society, and as tools for the observation, analysis and evaluation of:

a. the development and diversity of economic, social, political and cultural processes (human and economic geography, sociology, history, political science);

b. problems of personality, intellectual growth, inter-personal relationships (bio-psychological sciences, anthropology, social psychology).

Thus education is viewed as a scientific attitude in a Galilean sense, and in this respect it is a political education.

Pupil participation in the teaching and learning processes took the form of research (which replaced the lecture-lesson), collecting and arranging information, planning and carrying out surveys and reporting back to groups for comparison, discussion or evaluation. Government participation in the school lay in the possibility for representatives to sit on collegiate bodies.

The experimental control of learning was seen not as taking place after the experiment but as a fundamental part of it, and involved a series of measures designed to improve the quality of each phase of work: among the teachers, by adjusting plans and devising supportive action; and among the pupils, by accepting their limitations, striving to extend them, becoming aware of personal contributions, and constantly moving back into the group.

Setting aside the activities of the experimental schools, new problems have arisen recently in Italy as a result of DPR No 416. Communal management of the school, the autonomy of teachers and schools, student and parent attendance at assemblies, and opening the school to society, are the main features of an entirely new experiment in political education; this affects every school in Italy but it has come into effect so recently and is so far from assuming its final form that it is too early for any organic study.

It cannot in honesty be said that everything has been (or is) progressing smoothly, that there have been no difficulties, that every obstacle has been overcome and every problem solved.

It must be remembered that educational innovations are more often the result of social forces than of progress in educational science; they relate to political and social programmes which the school can only help to carry out, entailing new objectives, new concepts of education, new values. The growing interest in education calls for the definition of a policy of change, and a general political attitude that will encourage participation in change.

Even now, after the regulations governing experimentation have been laid down by DPR No 419, there are still many difficulties, and they may be with us for some time.

The difficulties are of several orders, and vary with local conditions. They may, however, be grouped into two main categories:

- intrinsic (ie. arising out of the nature of the instrument itself); the chief problem here is that it is impossible a priori to decide the structure of change and, at the same time, function at the concrete level;

- extrinsic, ie problems arising from the confusion and conflict prevailing at all levels of society, and the divergent expectations of the groups concerned.

I shall mention only a few aspects which are peculiar to the Italian scene.

For one, the experimentation which has begun in the first 2 years of the 5-year secondary course involves something which is still a preparation for a traditional 3-year course, and the contradiction inherent in this has often compelled experimenters to moderate their initiative, become self-enclosed, and inhibit the modernisation of contents, methods and approach. Other substantial difficulties arise from the prevailing vagueness of the underlying objectives of the new secondary education, the education-vocation relationship, the connections between curriculi in the 2 main sections (common case and optional), the obtention of school-leaving diplomas, and their value in the working world.

The introduction of new elements of knowledge and behaviour also encounters psychological obstacles or ones arising from the institutional and social context. The fact that the new elements have been first tried out in experimental schools means that neither their transfer to a wider context nor even their survival is ensured.

An atmosphere of suspicion, insecurity and conservatism continues to reign outside the school (and sometimes within it); for example, the fact that anyone can still be debating the problems of timetabling shows the persistance of old ways of thinking, and of the now obsolete idea that the principal variable in the "matetico" process (that is, the teaching-learning process) is time rather than the result obtained, which is dependent upon events in an internal process and is a psychological variable.

But it is one thing to talk about obstacles, difficulties and problems, and another to live through them as the people who are confronting the uncertain and arduous paths to modernisation are doing now, day by day and minute by minute, in running their schools.

As we know, no substantial change will take place until all teachers are involved in working out new programmes; research, moreover, which is now being carried out at group level, will not acquire coherence and scientific value until it becomes possible to control and compare similar and contrasting situations on a larger scale.

Nevertheless, the new education must go through this phase; and although it gives greater frredom to the people operating schools and all the forces involved in the educational process, it must maintain a careful balance among the objectives of the reform, together with clear and well-defined guidelines for overall development.